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A State-Based National Network for Effective Wildlife Conservation

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State wildlife conservation programs provide a strong foundation for biodiversity conservation in the United States, building on state wildlife action plans. However, states may miss the species that are at the most risk at rangewide scales, and threats such as novel diseases and climate change increasingly act at regional and national levels. Regional collaborations among states and their partners have had impressive successes, and several federal programs now incorporate state priorities. However, regional collaborations are uneven across the country, and no national counterpart exists to support efforts at that scale. A national conservation-support program could fill this gap and could work across the conservation community to identify large-scale conservation needs and support efforts to meet them. By providing important information-sharing and capacity-building services, such a program would advance collaborative conservation among the states and their partners, thus increasing both the effectiveness and the efficiency of conservation in the United States.

Keywords: biodiversity, collaborative conservation, regional conservation, land management, policy and ethics

Wildlife conservation efforts in the United States are facing major reductions in funding at the same time that climate change and habitat loss pose severe threats to conservation (Heinz Center 2008, Trout Unlimited 2011). Presently, the only national-level approach to conserving at-risk species of all taxa is through the Endangered Species Act (ESA), an instrument that can impose considerable social burdens precisely because it cannot be wielded until a crisis is imminent (Goble et al. 2005). A more flexible, effective, and economical approach is to keep common species common, to protect the integrity of the nation's ecosystems while reducing reliance on the ESA.

Existing state wildlife programs presently provide strong building blocks for a national network for collaborative conservation to keep common not only traditional game species but all wildlife species, by maintaining or increasing numbers and distributions to ensure long-term survival (Davis et al. 2008). However, to date, state programs have been inconsistently and incompletely integrated into regional and national networks. As a result, the network of wildlife agencies lacks a program or actor that can consistently monitor and protect wildlife species across their entire ranges, leverage state successes, or support best management practices in state wildlife agencies. In this era of reduced financing and increased threats, better, more consistent coordination of state-based efforts is increasingly necessary to maximize the effectiveness of limited conservation funds.

States as building blocks

Historically, the states had unlimited and exclusive legal authority over all wildlife within their borders. This changed over the course of the twentieth century as society's understanding of the powers conferred by the US Constitution evolved and as it became apparent that the states alone could not readily conserve some types of wildlife. Beginning with the enactment of the Migratory Bird Treaty Act in 1918, Congress has asserted federal power over eagles, migratory birds, marine mammals, ocean fisheries, and imperiled species. In addition, the federal government has the power as a landowner to control access to wildlife on the lands it owns, such as national parks and wildlife refuges (Freyfogle and Goble 2009). Furthermore, even with such "federal" species, the states often have some continuing management authority under federal law. For example, under the ESA, states can assume management authority over endangered species subject to federal oversight. The result is a complex tapestry in which the states have the primary power to manage wildlife other than those populations that are subject to specific federal jurisdiction.

The State Wildlife Grants Program, created by Congress in 2000 to protect at-risk but not-yet-endangered species, has enhanced states' capacity to conserve a wide range of wildlife species, moving beyond the traditional focus on game species (Stoms et al. 2010, Pauley 2011). The State Wildlife Grants Program provides matching funds for planning and implementing conservation actions described in state

wildlife action plans or comprehensive wildlife conservation strategies, hereafter referred to as SWAPs. In fiscal year 2012, funds available for the State Wildlife Grants Program totaled \$49 million (Siekaniec 2012).

Collectively, SWAPs represent a bottom-up approach to the nation's conservation priorities. Although approaches vary among states (Lerner et al. 2006, Davis et al. 2008, Fontaine 2011), each SWAP identifies species and habitats at risk, threats to those resources, information needs, and details of proposed conservation actions and plans for monitoring and improving conservation effectiveness. As a result, all states are now positioned to conserve the full range of wildlife species and ecosystems within their borders to the extent that funding permits.

The State Wildlife Grants Program builds on the long history of collaboration among state agencies, sporting groups, and federal agencies. SWAPs have strengthened these collaborations and encouraged many more; nationally, SWAPs involve more than 6300 partners and sponsors (Association of Fish and Wildlife Agencies 2010). State agencies have collaborated with nonprofit organizations (e.g., The Nature Conservancy participated in the largest private reforestation project in Delaware's history), with corporations (e.g., Pacific Gas and Electric participated in conservation projects in California), with federal agencies in every state, and with the citizens of their own states (e.g., private landowners participated in lesser prairie chicken [*Tympanuchus pallidicinctus*] conservation in Texas) (Cook 2008).

Expanding their range of partners allows states to benefit from expertise beyond traditional wildlife management (Pauley 2011). When citizens see disparate groups working for a common conservation goal, their trust in the participating agencies increases (Folke et al. 2005). In Tennessee, a coalition led by the state and The Nature Conservancy acquired nearly 130,000 acres on the Cumberland Plateau, an area highlighted in the state plan for its high biodiversity. To conserve such a large area, the collaborators used a combination of state and private funding and conservation tactics ranging from acquisition and conservation easements to timber management agreements with industry partners (TDEC 2007). The land is open to the public, but some timber harvest continues, which increases the diversity of economic activities and supports wildlife diversity.

Existing regional coordination

Regional-scale planning acknowledges ecological rather than political boundaries and helps blur the separation between game and nongame species management, because planning and implementing conservation at larger scales often benefits both (Groves et al. 2002). Traditionally, states have acted independently in conserving wildlife, with little encouragement or capacity to coordinate their actions regionally. However, interstate collaborations are becoming more common, leading to regional collaboration in landscape-scale conservation efforts for priority species and

ecosystems (Riexinger and Williamson 2009). For example, public and private entities across several southeastern states participate in regional collaborations, such as the Longleaf Alliance, which promotes conservation of longleaf pine (*Pinus palustris*) ecosystems. A competitive program based on the State Wildlife Grants Program, established in 2008, was the first granting program to encourage collaboration among states by prioritizing activities proposed jointly by two or more states (Wildlife and Sport Fish Restoration Program 2012). A commitment to the ongoing funding of this program would strengthen regional conservation efforts.

Successful regional collaborations for wildlife conservation have arisen from several different programs. Within the umbrella organization of state wildlife agencies—the Association of Fish and Wildlife Agencies (AFWA)—four regional subunits already provide varying levels of regional coordination. The northeastern AFWA subunit has been particularly active (Riexinger and Williamson 2009) and has a formal mechanism that allows member states to pool portions of their respective state wildlife grants to fund regional projects.

Among the western states, the Western Governors' Association (www.westgov.org) has provided leadership and support in several targeted initiatives—notably, in facilitating coordination among agencies and states in landscape corridor mapping and conservation (WGA 2008). The Western Governors' Association is not an organization designed to integrate western conservation efforts, but it does demonstrate how effective regional coordination can be in addressing difficult, high-priority conservation issues that cross state boundaries.

The Joint Ventures program of the US Fish and Wildlife Service (USFWS; www.fws.gov/birdhabitat/JointVentures/index.shtml), established in 1986, is a system of regional planning units in the United States that provides a model of federal–state–nongovernmental–organization–public cooperation. Well known within bird conservation circles, but not more widely, the 21 Joint Ventures were originally designed to protect waterfowl across the United States; they now contribute to bird conservation more broadly by providing a focal point for collaborative efforts within their individual ecosystem-based areas and by incorporating and coordinating a wide range of other bird-focused conservation programs under the umbrella of the North American Bird Conservation Initiative (www.nabci-us.org). The USFWS provides a coordinator and base staffing for each Joint Venture, but success rests on the strength of the regional collaboration. Overall, the Joint Ventures are reported to be a substantial positive addition to regional conservation of birds (Rich and Hoskins 2010).

The Landscape Conservation Cooperatives (LCCs; www.fws.gov/science/shc/lcc.html; Austen 2011), recently established within the USFWS, build on the success of the Joint Ventures program to address landscape-scale conservation issues across the United States. The 22 LCCs were established

in 2010 and 2011 and are only beginning their work; each LCC will have a coordinator and a senior scientist, but as with the Joint Ventures, the LCCs are designed to provide a focus for efforts whose success will rest on partnerships and collaborations.

Among the existing regional organizations, only the LCCs aspire to protect all wildlife taxa in a set of regions that covers the United States. The AFWA regions are primarily administrative entities and are uneven in their conservation activity; the Joint Ventures are largely focused on avian conservation; the Western Governors' Association is limited to western states and is not specifically wildlife oriented.

Integration of SWAPs into federal programs

State and federal conservation programs can and should be complementary; state SWAPs receive information and resources from federal programs and also influence federal programs to support state-level priorities. Three examples suggest the degree to which federal programs already work with SWAPs. The US Bureau of Land Management's Healthy Lands Initiative used SWAPs to balance energy development and wildlife habitat concerns (USDOI 2008). Under the Farm Bill, the US Department of Agriculture manages several programs, such as the Conservation Reserve Program's State Acres for Wildlife Enhancement program, which funds habitat restoration primarily on the basis of SWAPs (FSA 2008). In the most recent iteration of the highway bill, Congress mandated that long-term transportation plans be developed through evaluations of state conservation plans, such as SWAPs (Public Law 109-59 § 6001).

State and regional capacity for collaborative conservation

Many states implemented their SWAPs by adding or reassigning staff, developing new information sources, expanding outreach and partnership capabilities, or elevating the priority of nongame wildlife in relation to previous game management activities. In at least 30 states, staff increases or reassignment enabled agencies to expand their conservation work (Davis et al. 2008).

However, despite many successes from the State Wildlife Grants Program, states still vary widely in staffing and in the level of training of conservation professionals, and plans vary in the kinds and quantities of data gathered (Davis et al. 2008, EMWG 2011). Building effective, state-based regional and national collaborations will require a more level playing field, but even as states are moving to build capacity, the current economic crisis is undermining their efforts. In North Carolina, for example, state trust funds for water and land conservation were used for general state expenditures, and conservation programs were shifted among state agencies or dismantled altogether during the 2011 budget session (Kuo 2011).

Capacity needs within individual state agencies range from increased GIS (geographical information system) expertise to training in leadership and outreach (Davis et al.

2008). Despite considerable experience with partners, states report challenges managing collaborations even with traditional partners such as hunters and fishers; regional conservation partnerships are even more complex (Riexinger and Williamson 2009). Particularly crippling in some agencies is the lack of familiarity with fundraising and grant writing. Some states regularly forgo submitting proposals for State Wildlife Grants Program that require matching funds, because they are uncertain how to represent in-kind matches from their partners (Davis et al. 2008). Training in new techniques in resource management is also needed. State wildlife grants are available for capacity building, but they could be more carefully targeted to reduce differences among states in key areas of expertise.

Just as individual states can benefit from capacity building, regional groups of states need to build capacity for joint planning. For example, inconsistent mapping standards hamper cross-boundary conservation efforts; incompatible databases inhibit merging information on species and threats in order to build national-level databases and inform national priorities. Federal technical support, building on experience from multistate analyses from the Gap Analysis Program (Prior-Magee et al. 2007) and from early multistate efforts (Riexinger and Williamson 2009), could alleviate some of these cross-state challenges.

Implications of a national-level gap in coordination

The examples given above clearly demonstrate that integrated state efforts can result in powerful and effective conservation and that SWAPs are already affecting federal programs. However, even with increased capacity, no existing regional partnership is positioned to offer national-scale coordination. As a result, problems that would benefit from coordinated state efforts are addressed inefficiently, to the long-term detriment of wildlife species. A study of state *threatened* and *endangered* bird species lists showed that locally rare but globally secure species often dominate state lists (Wells et al. 2010), whereas species that are declining throughout their ranges but are not yet obviously rare may go unprotected. Although the State Wildlife Grants Program was specifically designed to help states support these not-yet-rare species, it may fail to do so because individual states have neither mandate nor capacity to track species rangewide. A national-level conservation-support system could provide the necessary data synthesis to detect rangewide declines while flexible responses are still tenable.

Emerging wildlife diseases also create circumstances in which national coordination is needed to most efficiently determine impacts and develop solutions. Those that affect endangered species or cause species to decline into endangerment (e.g., white-nose syndrome in bats) or affect game species (e.g., chronic wasting disease in cervids) may receive rapid, strong responses. However, others, such as chytrid fungus, which has been identified as a global threat to amphibian biodiversity but is only one of many factors

threatening US amphibians, receive little attention at the national level, leaving states to face them piecemeal. National coordination and support could speed dispersal of research results, reducing response time and wildlife losses.

Support for regional and national conservation planning to address climate change is improving. Forums for sharing climate change information have been created, such as the CASES Adaptation Library (<http://cases.washington.edu/cig/cases/library>) and the Climate Adaptation Knowledge Exchange (www.cakex.org; Gregg 2010). In addition, climate-change information is available from the National Climate Change and Wildlife Science Center (<https://nccwsc.usgs.gov>) and its eight regional climate centers (Beard et al. 2011) and from the National Phenology Network (www.usanpn.org; Enquist 2011), but this abundance of support is limited to the issue of climate change; no broader conservation forums have emerged.

Confronting the national-level gap

The choice of a home for a national conservation-support program is not immediately obvious. A program that supports state wildlife agencies on a continuing basis may not be best served by a home within a federal agency because of the potential for relatively frequent administrative changes in focus and support for conservation philosophies and actions. A more independent and broadly funded home, perhaps along the lines of NatureServe (www.natureserve.org), might provide a more stable environment.

The mission for a national program that supports and coordinates a national conservation network and landscape-to national-scale conservation efforts should be adaptive, but initially, the following goals would immediately contribute to national conservation.

Establish a common habitat classification map. Collaborative, regional, and national conservation requires a common planning base. In conservation, such planning almost invariably includes considerations of ecoregions, vegetation communities, or habitats. A single seamless map would provide a common data layer and a common vocabulary available to all actors and readily understood by funding agencies, reviewers, and users. Such a map is finished for 13 northeastern states and is being expanded to include the Upper Midwestern states as well (NatureServe 2008); the product references the national-level Gap Analysis Program, NatureServe, and LANDFIRE (www.landfire.gov) maps, which are cross-walked among themselves.

A single national map—even one created with input from all relevant agencies and organizations—will not serve all uses (e.g., local conservation efforts may require higher resolution). Nevertheless, the need for specialized and localized maps does not diminish the need for a map that supports large-scale planning efforts. Existing national maps, including the National Landcover Database and LANDFIRE maps, already support a minimum resolution overall but higher resolutions for some areas and cover types. Cross-walking

of classifications from the supported national map to other US national maps, to national maps of Mexico and Canada, and to regional and state maps will improve the utility of all maps; the national support program could assist with such crosswalks or could undertake them where local capacity does not exist.

Identify at-risk species. At-risk species that are both outside of the limited umbrella of federally managed species and declining rangewide across multistate areas should be identified. States consistently list species-specific conservation information among their greatest needs in fulfilling their SWAP goals (Davis et al. 2008). Even migratory birds, which are well supported by existing wide-ranging conservation efforts and under the umbrella of federally managed species, are not well protected by state *threatened* and *endangered* lists (Wells et al. 2010). A national conservation-support program could gather information to identify and minimize threats to wide-ranging, uncommon species at regional, national, and international scales. The support program could also serve, at least initially, as the coordinator for efforts to address these cross-boundary conservation needs.

Coordinate and leverage capacity-building opportunities. A completely level playing field is an impossible and unnecessary goal for a national network for collaborative conservation, but advancing the capacity of all players and minimizing major variation in capacity are reasonable goals for a national support program. In addition to providing some training and perhaps equipment grants, the support program could publicize training opportunities offered by other members of the conservation community and could support efforts to make such training opportunities widely available—through support for Webinars and video recording, for example.

Facilitate and enhance information dissemination. States have limited personnel and funds to track information of many kinds (e.g., training opportunities, funding opportunities, news updates, changes in policies and legal requirements). A Web-based clearinghouse for such information would increase the use of these services and would increase the efficiency of users seeking them. Most urgent, a support program could develop a means of rapid communication for time-sensitive and urgent information, such as information about disease outbreaks.

In the absence of a national program to support conservation, piecemeal attempts to fill the gap have begun to appear, such as the climate-change forums mentioned above. A national support program could assist with cross-linking of information-sharing forums to minimize the duplication of information and could provide a centralized, updated set of links to established external information sites relevant to conservation planning (e.g., NatureServe, The Nature Conservancy's Climate Wizard [www.climatewizard.org]). The program could also expand or supplement existing

forums, where that is necessary, to provide the full range of desired functions. To ensure transparency, the program could provide regular reports on its activities on a Web site and at relevant national meetings.

Incorporate new data tools. Finally, new data tools should be incorporated into conservation efforts by documenting the potential uses of these tools as they become available. The program can facilitate the adoption of new tools and technology or products of these new tools (e.g., climate-model downscaling) by providing or sharing information about training opportunities using the information-dissemination system discussed above.

A variety of actors—the USFWS, the US Geological Survey, The Nature Conservancy, and many others—currently provide training and support programs. However, the multiplicity of players can create a burden for states with limited funds to support participation in so many collaborations (Ryder 2011) and still provides no national-level support for upscaling conservation of those wildlife species that may benefit from a nationwide perspective. A national conservation-support program would reduce the burden on states and improve the cost effectiveness for all members of the conservation community. Effectiveness will also be improved if the basic logistics of communication and the choice of initial priorities can be worked out quickly.

Funding a new national program will be difficult in the present economic environment. An independent program could be funded at least in part by contributions from the agencies and organizations it supports (as NatureServe is funded, in part). The northeastern states within USFWS Region 5 have contributed portions of their State Wildlife Grants Program monies, on a continuing basis, to fund regional efforts such as the regional landcover map. The nature of the goals described above permits an incremental approach to the national support function, which may increase the chance for long-term success, because partners could see an immediate benefit as a result of small initial contributions. Additional private funding may be available in instances in which collaboration can provide benefits for industry through the mitigation of environmental impacts. Targeted training can assist states to take increased advantage of such opportunities for supplementary funding.

The LCCs: Partners and experiments in collaborative conservation

The LCCs aim to integrate efforts of state, federal, and nongovernmental organizations, and other partners within the individual cooperatives (Austen 2011). To be effective facilitators, LCC coordinators will need to bring to the table significant training in building adaptive governance and management programs, fostering cooperation, and improving communication. Such training has been slow to take hold in the natural resources arena (Jacobson CA and Decker 2006, Baydack et al. 2009). The LCCs' Web site and publications identify no plans to build capacity specific to

the role that they aspire to play, but the LCC system is still inventing itself.

LCCs will probably provide at least some of the functionality proposed here for a national conservation-support program, at the ecoregional level (see, e.g., O'Brian 2011). The LCC system of ecoregions thus represents a set of experiments in collaborative conservation that, assuming it reaches administrative maturity, could inform and advance progress by the proposed national program. Variation among the LCC ecoregions in socioeconomic and political factors, as well as individual differences among LCC coordinators, should produce different approaches, problems, and solutions in collaborative conservation.

As the program matures, the LCCs are likely to facilitate an increasing number of regional conservation projects, allowing a national conservation-support program to be focused on issues at larger landscape scales. The governance structure of LCCs—each is led by a board of regional collaborators—provides no obvious mechanism for scaling up to the national level. The national program proposed here could provide that structure. The two programs represent the medium- and broadscale portions of a collaborative national network for conservation and would be most effective if they learned from and leveraged each other's successes.

Conclusions

A national, collaborative conservation network built on a foundation of the SWAPs can be an effective and economical way to respond to the many landscape-scale threats to wildlife diversity. States already possess expertise and tools for effective wildlife management within their borders. More consistent regional collaboration and a mechanism for national coordination are needed to anchor the upscaling of local information and efforts and the downscaling of national and continental models and instruments. Effective collaboration will require clear agreement on which role each collaborator will play and which conservation goals will be addressed.

Many states will be revising their SWAPs in the near future and can include provisions for regional collaborations in the updated plans at the same time that the LCCs are establishing themselves as facilitators of such collaboration. For a short window of time, both federal (LCC) and state programs have some flexibility in planning and much to gain from efficiencies of scale and enhanced communication.

In revising their SWAPs, state agencies have the opportunity to develop goals related to enhanced collaborations that can then become guidelines for the State Wildlife Grants Program and related funding (e.g., Wondolleck and Yaffee 2000, Jacobson SK 2009, Long 2009). In addition to prioritizing wildlife-focused skills and practices, socially focused skills that improve fundraising, communication, and collaboration could be identified and meaningfully addressed. A national conservation-support program could be a key partner in these future collaborations, assisting in identifying cross-regional, national, and international

management- and policy-relevant issues (e.g., Fleishman et al. 2011) and in addressing upscaling and downscaling solutions that cross institutional and political boundaries.

Appropriately scaled conservation efforts make the most efficient use of limited funds, maintain ecological integrity and ecosystem services, and reduce the need for more stringent environmental protections. Investing these funds in a collaborative structure linking state, federal, and other conservation programs to enhance work at state to international scales will be far more efficient than piecemeal allocations to separate agencies and organizations—and will be far more effective than waiting for species to decline into endangerment.

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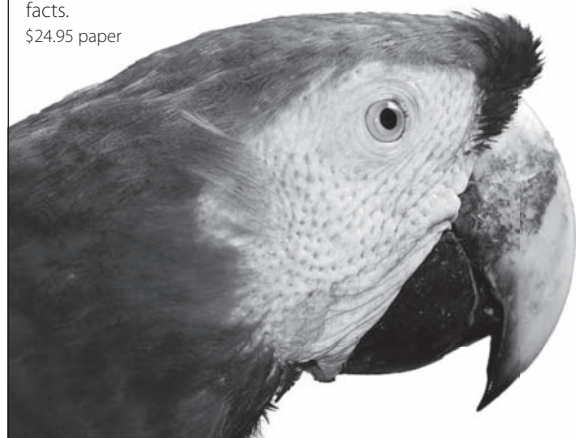
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